

POTAMALPHEOPS DARWINIENSIS
(CRUSTACEA: DECAPODA: ALPHEIDAE), THE
THIRD INDO-WEST PACIFIC SPECIES

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Abstract.—Two species of the “African” alpheid shrimp genus *Potamalpheops*, *P. hanleyi* Bruce and *P. pininsulae* Bruce, have been recorded from the Indo-West Pacific region. The genus is otherwise known from four West African species and one species from a Mexican freshwater cave. A third Indo-West Pacific species, *P. darwiniensis*, from mangroves in Darwin Harbour, Northern Territory, is described and illustrated. The new species is closely related to the other Indo-West Pacific species, and a key is provided for their identification.

The first species of the genus *Potamalpheops* to be discovered was *P. haugi*, described by Coutière (1906) as *Alpheopsis haugi*, from Gabon. Subsequently Sollaud (1932) described *Alpheopsis monodi* from the Cameroons and Senegal. Hobbs (1973) significantly extended the range of the genus *Alpheopsis* when reporting *A. stygicola*, from a freshwater cave at Oaxaca, Mexico. Powell (1979) recorded a third African species, *P. pylorus*, from Nigeria and designated the genus *Potamalpheops* to include also the earlier described species. Hobbs (1983) concluded that *A. stygicola* should also be included in the genus *Potamalpheops*. Recently, Bruce (1991) reported the first occurrence of the genus in the Indo-West Pacific region, with *P. hanleyi* from Darwin Harbour, Australia, and then the presence of a second troglobitic species, *P. pininsulae*, from the Isle of Pines, New Caledonia. The presence of another West African species, in the Calabar River, has been indicated by Powell (1979), but this species is still undescribed. A second Australian species has recently been collected and is here described and illustrated.

Systematic Account

Alpheidae Rafinesque, 1815

Potamalpheops Powell, 1979
Potamalpheops darwiniensis, new species
Figs. 1-3

Material examined.—1 ♂, holotype, station JRH 2-Q3-(M), Hudson's Creek, Darwin Harbour, Northern Territory, Australia, 12°28.75'S, 130°55.67'E, 23 Feb 1991, intertidal, coll. J. R. Hanley, Northern Territory Museum Cr. 007922.

Description of holotype.—Small, of sub-cylindrical body form, body slightly compressed, with the distal part of left third maxilliped and second pereopod missing, right second pereopod in early stage of regeneration.

Rostrum (Fig. 2A, B) very short, scarcely exceeding anterior margin of cornea, acute, broadly triangular in dorsal view, dorsal carina obsolete, ventral carina feebly developed, unarmed, lateral carinae broad, confluent with orbital margin.

Carapace depilate, smooth; orbital margin concealing major portion of eye (Fig. 2B), with very feebly developed, rounded, antennal region, pterygostomial angle slightly produced, bluntly angular, ventral margin with numerous plumose setae; cardiac notch distinct.

Abdomen depilate, glabrous; sixth segment (Fig. 2H) about 1.2 times length of

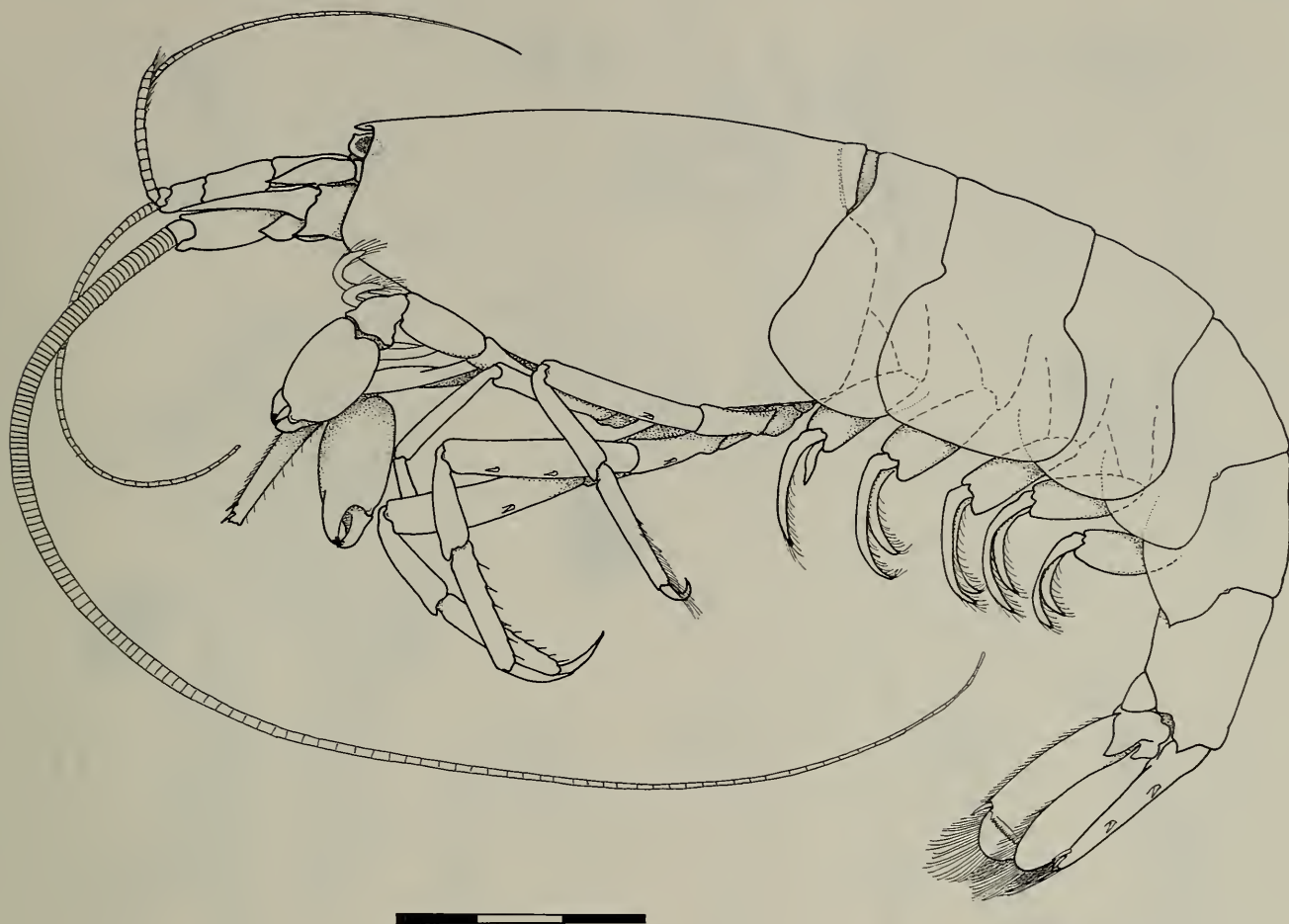


Fig. 1. *Potamalpheops darwiniensis*, new species, holotype male, Hudson's Creek, Darwin. Scale bar in mm.

fifth, 1.5 times longer than deep, compressed, posterior lateral angle acute, posteroventral angle with articulated triangular plate; pleura of first four segments broadly rounded, fifth subrectangular, posteroventral angle subacute. Telson (Fig. 2K) about 1.25 times length of sixth segment, 1.8 times longer than anterior width, lateral margins straight, posteriorly convergent, with small dorsal spines, about 0.07 of telson length, anterior pair at 0.3 of telson length, posterior pair at about 0.6 (spine missing on right); posterior margin (Fig. 3G) broad, about 0.6 of anterior width, with 2 pairs of robust subequal subventral spines laterally, about 3.0 times length of dorsal spines, central portion of posterior margin semicircular, occupying about half posterior margin width, with about 20 long plumose setae, with numerous short slender simple spinules dorsally; anal tubercles feebly developed.

Antennule (Fig. 2E) with peduncle robust, about 0.4 of carapace length, distinctly exceeding scaphocerite and carpocerite; proximal segment about 1.4 times longer than proximal width, distodorsal margin nondentate, with well developed ventromedial carina; statocyst normally developed; with broad acute stylocerite reaching distally to anterior margin of segment; intermediate segment subcylindrical, about 1.1 times proximal segment length, 2.0 times longer than wide, ventromedial border with long plumose setae; distal segment subcylindrical, about 0.5 of intermediate segment length; upper flagellum biramous, proximal 13 segments fused, shorter ramus with single free segment only, with about 8 groups of aesthetascs; lower ramus slender, filiform, subequal to longer upper ramus length (tips of rami missing).

Antenna (Fig. 2F) with stout basicerite, with small acute process projecting laterally

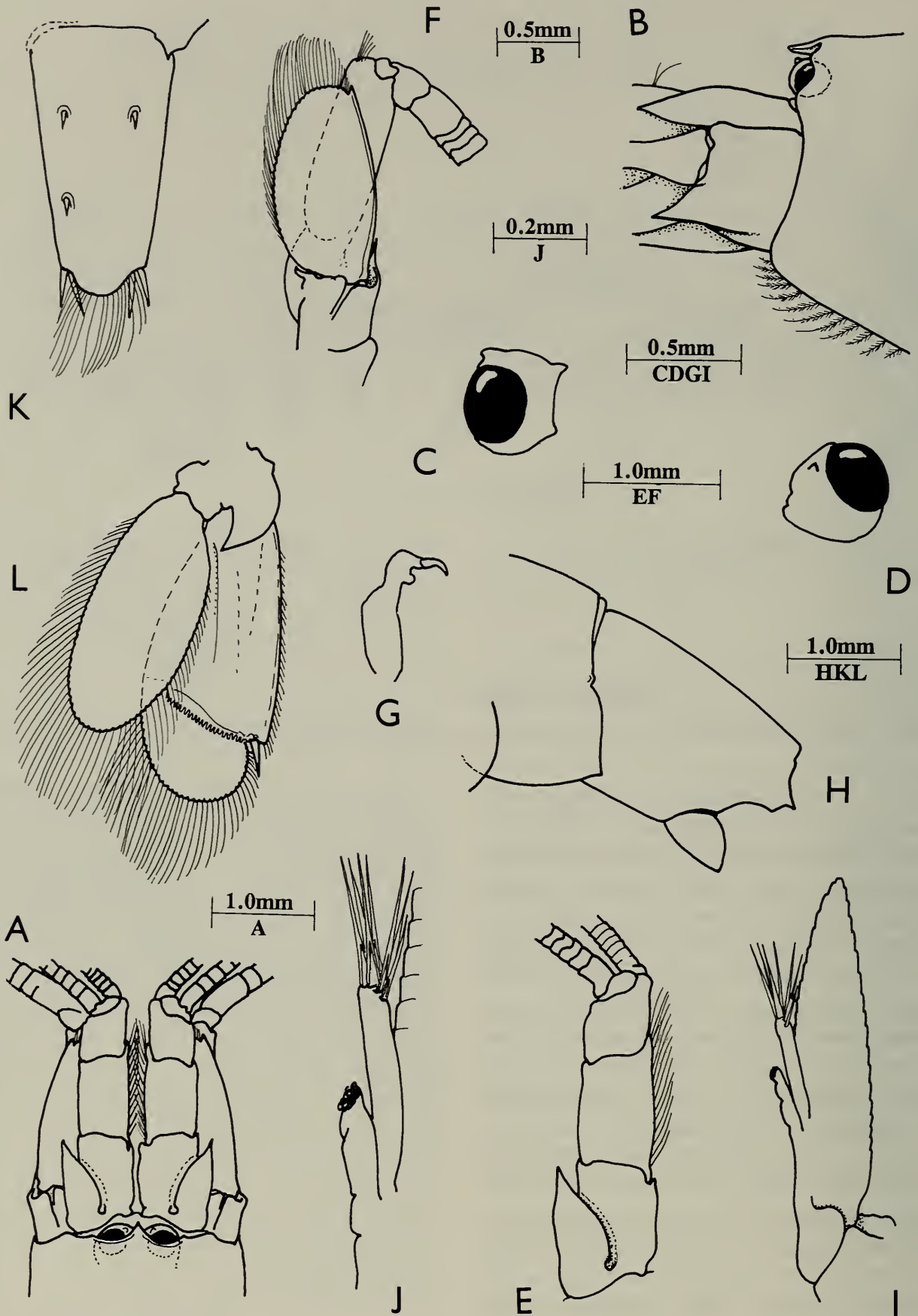


Fig. 2. *Potamalpheops darwiniensis*, new species, holotype male. A, Anterior carapace and antennal peduncles, dorsal. B, Anterior carapace, lateral. C, Eye, lateral. D, Same, dorsal. E, Antennular peduncle. F, Antennal peduncle. G, Epipod of first pereopod. H, Sixth abdominal segment, lateral. I, Endopod of second pleopod. J, Same, appendices interna and masculina. K, Telson. L, Uropod.

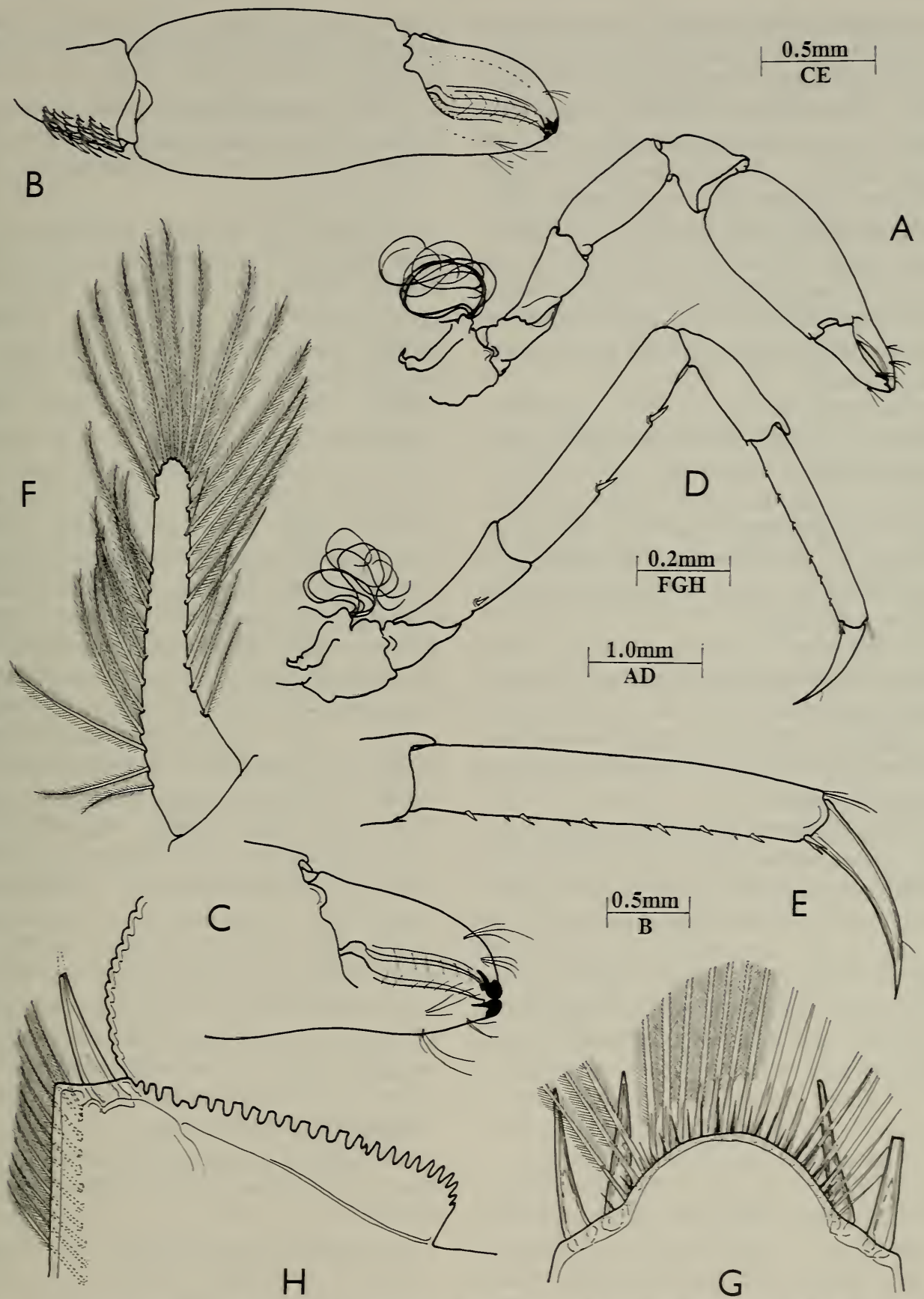


Fig. 3. *Potamalpheops darwiniensis*, new species, holotype male. A, Right first pereiopod. B, Same, chela. C, Same, fingers. D, Right third pereiopod. E, Same, propod and dactyl. F, Endopod of first pleopod. G, Posterior margin of telson. H, Uropod, diaeresis of exopod, dorsal.

from anterodorsal margin, with strong acute ventrolateral tooth, carapocrite robust, distinctly exceeding distal margin of scaphocerite, subcylindrical, slightly compressed, about 3.0 times longer than wide, flagellum long, slender, 2.2 times carapace length, proximal segments not thickened; scaphocerite reaching to about middle of distal segment of antennular peduncle, 1.8 times longer than wide, suboval, lateral margin convex, with small acute distal tooth scarcely exceeding broadly rounded anterior margin of lamella.

Eyes reduced (Fig. 2C, D), largely concealed by anterior margin of carapace, anterior surface of cornea only exposed in dorsal view, contiguous in midline, cornea small, well pigmented, peduncle short, subcylindrical, medial surface flattened, with small distinct subacute dorsomedial tubercle, without setae.

Mouthparts not dissected. Third maxilliped extending to distal end of antennular peduncle, terminal segment tapering distally, obliquely truncate, with 4 stout spines, largest spine strongly cornified; coxa with strap-like epipod.

First pereopods (Fig. 3A) subequal, similar, chelae appearing to be carried in flexed position; chelae (Fig. 3B) robust, slightly longer on left, slightly stouter on right, about 0.4 of carapace length, palm subcylindrical, slightly swollen, compressed, smooth, about 1.65 times longer than deep, fingers (Fig. 3C) stout, about 0.6 of palm length, feebly subspatulate, with very stout, strongly cornified, blunt, feebly bidentate tips, dactylus about 2.8 times longer than deep, curved, with entire sharp unarmed cutting edge; carpus stout, about 0.28 of chela length, 0.45 of palm length, distally excavate, unarmed, with about 7 transverse rows of long serrulate cleaning setae ventromedially; merus about 0.5 of chela length, 2.4 times longer than wide, uniform, ventral surface feebly excavate, unarmed; ischium about 0.38 of chela length, 2.0 times longer than distal width, tapered proximally, unarmed; basis obliquely articulated with ischium, un-

armed; coxa robust, with 6-setose seto-branch dorsally, strap-like epipod (Fig. 2G) laterally.

Second pereopod (left) with proximal carpus and proximal segments showing no special features, coxa with seto-branch and strap-like epipod.

Ambulatory pereopods moderately robust; third pereopod (Fig. 3D) slightly exceeding antennular peduncle by length of dactyl, dactyl (Fig. 3E) slender, simple, curved, compressed, about 0.5 length of propod, ventral margin sharply carinate, without clearly demarcated unguis, with single seta distodorsally; propod (Fig. 3E) about 0.3 of carapace length, 6.0 times longer than wide, uniform, glabrous, with pair of short simple distoventral spines, about 0.12 of dactyl length, ventrolateral row of 6 small spines, ventromedial row of 4 smaller spines; carpus about 0.6 of propod length, 3.2 times longer than distal width, with small distoventral spine; merus 1.35 times longer than propod, 5.2 times longer than wide, uniform, with large mobile ventrolateral spines at 0.38 and 0.68 of length; ischium about 0.5 of merus length, 2.4 times longer than distal width, strongly tapered proximally, with single small mobile spine ventrolaterally; basis normal; coxa robust, with 6-setose seto-branch dorsally, strap-like epipod laterally. Fourth pereopod similar to third. Fifth pereopod similar to fourth, more slender, dactyl 0.5 of propod length, propod 6.0 times longer than wide, 0.55 of carapace length; merus with proximal ventrolateral spine; ischium unarmed; coxa with seto-branch, without epipod.

Abdominal sternites with narrow transverse ridges between bases of pleopods, unarmed.

Pleopods normal. Endopod of first pleopod (Fig. 3F) slender, 3.6 times longer than basal width, curved, tapering distally, with 11 plumose setae medially, 17 similar setae distally and laterally, distal setae longer, about 0.6 of endopod length. Endopod of second pleopod (Fig. 2I) 5.0 times longer than wide, with appendices at 0.38 of length;

appendix masculina (Fig. 2J) subcylindrical, 7.0 times longer than wide, with 4 long simple terminal spines, about 0.6 of corpus length, 3 similar spines distomedially; appendix interna short, reaching to middle of appendix masculina corpus, with few distal cincinnuli.

Uropod (Fig. 2L) with protopod bearing large acute distodorsal lobe, rami slightly exceeding posterior telson margin; exopodite 2.3 times longer than wide, greatest width at 0.6 of length, lateral margin slightly convex, with well developed submarginal setal fringe, distolateral angle subrectangular, with large mobile spine medially, diaeresis (Fig. 3H) well developed with dentate dorsal flange laterally extending across about 0.8 of width, with about 24 small subuniform acute teeth (tips of many abraded), distal lamella large, broadly rounded, highly flexible, with short simple spiniform marginal setae distolaterally, otherwise with long densely plumose marginal setae; endopodite about 0.9 of exopod length, 2.2 times longer than wide.

Measurements. — Carapace length 6.2 mm, total body length (approx.) 17 mm.

Etymology. — Specific name derived from locality of capture, Darwin Harbour.

Habitat. — “Mud-mound,” amongst mangroves.

Affinities. — *Potamalpheops darwiniensis* is closely related to the two other Indo-West Pacific species, both of which belong to the species group characterized by the presence of two pairs of posterior telson spines instead of three. This group also includes the West African species *P. monodi* (Sollaud, 1932), from Cameroon and Senegal.

Potamalpheops darwiniensis is most closely related to *P. hanleyi*, which is also known only from Darwin Harbour. *Potamalpheops darwiniensis* may be distinguished from *P. hanleyi* by the following features: — (1) the presence of a much shorter rostrum, only slightly exceeding feebly produced blunt extracorneal teeth; (2) the feebly produced antennal and pterygostomial angles; (3) the presence of numerous

short plumose setae at the pterygostomial angle; (4) the subrectangular, posteroventrally subacute pleuron of the fifth abdominal segment; (5) dorsal telson spines at 0.3 and 0.6 of telson length; (6) convex central portion of posterior margin of telson more than half posterior margin width, with more numerous plumose setae; (7) proximal segment of antennular peduncle with distodorsal margin lacking denticulations, ventromedial carina distally subrectangular; (8) basicerite with acute distolateral process dorsally; (9) carpocerite distinctly exceeding scaphocerite; (10) scaphocerite oval in shape, with distolateral tooth scarcely exceeding lamella; (11) eye markedly reduced, largely concealed by anterior carapace, cornea small, eyestalk flattened medially with small acute dorsomedial tubercle; (12) first pereopods with robust chelae; (13) third ambulatory pereopod with propod more slender, 6.0 times longer than distal width, with ventromedial and ventrolateral spine rows; (14) male first pleopod endopod elongate, tapering, curved, with numerous long plumose setae distomedially; (15) male second pleopod endopod with appendices arising at less than half medial margin length, appendix masculina with 7 longer spines distally; (16) exopod of uropod with distolateral angle subrectangular, diaeresis with about 24 small acute denticles.

Potamalpheops darwiniensis is readily distinguished from the only other Indo-West Pacific species, *P. pininsulae*, by its lack of a long, slender, acute, ventrally dentate rostrum.

Discussion

Little is known about the precise ecological niche occupied by the various species of the genus *Potamalpheops*. The collection of the single specimen of the present species from a “mud-mound” suggests the possibility that this species may be associated with some burrowing invertebrate. Mangrove “mud-mounds” are commonly produced by annelids or decapod crustaceans, particularly thalassinids. No Indo-West Pa-

cific caridean shrimps are so far known to associate with thalassinideans.

The discovery of a third species of *Potamalpheops* in the Indo-West Pacific region clearly establishes this genus a component of its fauna. It seems likely that additional specimens or species of these shrimps, which are so far known only from very shallow coastal or fresh waters, will be found in due course, and will link the eastern distribution of the Indo-West Pacific species with those with the West African species.

The Mexican species, *P. stygicola*, may be less closely related to the other species of the genus, from which it differs by the presence of a remarkable longitudinal hepatico-branchiostegal groove (Hobbs 1973) that cannot be discerned in the other non-Mexican species. *Potamalpheops stygicola* could well have had an independent evolutionary origin from the other species of the genus *Potamalpheops* and may belong to a separate genus.

Key to the Indo-west Pacific Species of *Potamalpheops* Powell

1. Rostrum well developed, reaching to distal margin of proximal segment of antennular peduncle, with single acute ventral tooth
. *P. pininsulae* Bruce, 1993
- Rostrum short, not nearly reaching distal margin of proximal segment of antennular peduncle, ventrally unarmed 2
2. Rostrum very short, not reaching bases of antennular peduncles; eyes reduced, largely covered by anterior carapace; extracorneal tooth obsolescent; first pereopods well developed, with robust chelae; diaeresis of exopod of uropod with about 24 small acute denticles
. *P. darwiniensis*, new species
- Rostrum exceeding middle of proximal segment of antennular pedun-

cle; eyes well developed, cornea largely exposed by anterior margin of carapace; extracorneal tooth acute; first pereopods feebly developed, with small chelae; diaeresis of exopod of uropod with about 18 acute teeth *P. hanleyi* Bruce, 1991

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